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ABSTRACT

Mercenaries in Civil Wars, 1950-2000

by Sven Chojnacki, Nils Metternich and Johannes Münster *

This paper investigates the determinants of mercenary participation in civil wars during the second half of the 20th century. We present a new dataset on mercenary activities and use it to test hypotheses derived from a simple game-theoretic model of demand and supply in the market for force. We find that higher GDP and diamond deposits in a country increase the probability that mercenaries fight in an internal war. Military interventions also increase the risk of mercenary involvement, with the exception of UN interventions.

ZUSAMMENFASSUNG

Söldner in Bürgerkriegen, 1950-2000

Diese Arbeit untersucht die Determinanten von Söldneraktivitäten in Bürgerkriegen in der zweiten Hälfte des 20ten Jahrhunderts. Wir präsentieren einen neuen Datensatz über Söldneraktivitäten und verwenden ihn, um Hypothesen zu testen, die aus einem einfachen spieltheoretischen Modell von Angebot und Nachfrage auf dem Söldnermarkt hergeleitet werden. Die Hauptergebnisse sind wie folgt: Ein höheres BIP pro Kopf und Diamantenvorkommen in einem Land erhöhen die Wahrscheinlichkeit, dass Söldner in einem Bürgerkrieg kämpfen. Militärische Interventionen steigern ebenfalls das Risiko von Söldnern, mit Ausnahme von UN Interventionen.

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In a third of all wars in the second half of the 20th century, one or the other warring faction hired mercenaries - foreigners who actively fought for money and who were not integrated in the regular armed forces. Thus, mercenaries are frequently engaged, in spite of several initiatives to ban them.[1] Mercenaries raise security concerns, since they are not embedded in the control and accountability mechanisms of regular troops. Indeed, mercenaries are often accused of human rights violations. On the other hand, privatizing the military seems to some to be an attractive option, with some commentators even advocating to "send in the mercenaries" or their modern incarnation, private military companies, where the UN is unwilling or unable to intervene.[2] All sides of the debate seem to agree, however, that a regulation of the trade is necessary.

Any attempt to regulate mercenary activities and private military companies, however, needs to be informed about the driving forces in the market for force. While there is a large literature on these issues, including case studies and historical accounts, quantitative studies are missing, which is due to the unavailability of sufficient data. This paper provides a quantitative analysis of the determinants of mercenary activities in civil wars during the second half of the 20th century. We present a new dataset based on a systematic analysis of all articles published in five major newspapers containing keywords such as "mercenary/ies", and use our data to test several hypothesis derived from a simple game theoretic model of the market for force.

We think about mercenaries in terms of demand and supply: mercenaries will fight in a war if and only if some party to the conflict is willing and able to pay a price for their service, and there are some potential mercenaries who, for this price, are willing to fight. Any factor that increases the will-

[1] Compared with previous centuries, the use of mercenaries got discredited in the 20th century. See Thomson (1994) for an historical account, Singer (2004) for a summary of UN and OAU attempts to ban mercenarism, and Percy (2007) for a history of the norm against mercenaries.

[2] E.g. Max Boot, LA Times, May 31, 2006. See also the discussion in Shearer (1998) and the green paper "Private Military Companies: Options for Regulation" of the UK government.

ingness or ability of conflict parties to pay for mercenaries will increase the probability of mercenary involvement. One such factor could be the wealth of the country. We focus on the effect of GDP and on natural resources. Similarly, the presence of a military intervention might raise the demand for mercenaries, either by providing the financial means for paying the mercenaries, or by hiring them directly. We also study whether the regime type impacts on the probability of mercenaries. Turning to the supply side, we consider the effect of changes in global troop sizes in the years preceding the conflict.

We find that mercenaries are more likely to participate in wars in richer countries, and in particular in countries with diamond mines. Moreover, external interventions increase the incidence of mercenaries, with the exception of UN interventions. However, we can not confirm any effect of changes in global troop size.

Our paper is related to three strands of the literature. First, there is an extensive literature on the market for force in general, and on mercenaries and private military companies in particular. See, for example, Thompson (1994) for a historical view, Musah and Fayemi (2000) on Africa, and Singer (2003) and Avant (2006) on recent transformations and private military companies. While this literature includes many case studies and theoretical considerations, our contribution is to give a quantitative analysis.

Second, the paper is related to the literature on the role of natural resources in conflicts, which was started by Collier and Hoeffler (1998).[3] This literature considers natural resources as determinants of conflict onset and duration. Guidolin and La Ferrara (2007) consider the effects of the civil war in Angola on diamond trading firms. Our research focuses on how natural resources impact on one aspect of the *conduct* of the warring factions: whether or not they hire mercenaries. Our findings indicate that a better governance of natural resources might not only help to prevent or end conflicts in the first place (World Bank 2003), but might also reduce the prevalence of mercenaries.

Third, there is a strand of the literature studying outside interventions

[3] Recent overviews are Ross (2006) and Collier and Hoeffler (2007).

into conflict. Several papers argue that interventions are associated with a longer duration (Regan 2000, 2002; Elbadawi and Sambanis 2000; Balch-Lindsay and Enterline 2000; however, Collier, Hoeffler, and Söderbom 2004 find that interventions on the side of the rebels tend to shorten conflicts). Other papers have studied the relation between intervention and civil war outcomes (Regan 1996, Mason and Fett 1996, Mason, Weingarten, and Fett 1999, Walter 1997, 2002) or have addressed both duration and outcome simultaneously (Balch-Lindsay, Enterline, and Joyce 2008). We add to this literature by pointing out the correlation between mercenaries and outside military interventions. This also sheds new light on possible causal mechanisms that might be driving the positive correlation between interventions and conflict duration reported in the literature.

The remainder of the paper is organized as follows. Section 1 discusses the definition of "mercenaries". Section 2 specifies our theory, Section 3 the hypotheses, and Section 4 the empirical model. Section 5 discusses the data. Section 6 presents our main results. Here we also take a closer look at interventions, distinguishing between UN interventions and others. Moreover, we investigate whether US interventions are special. Several robustness checks are reported in Section 7. We conclude with a discussion of the limitations of this study and avenues for future research in Section 8.

1 Mercenaries

The exact definition of "mercenaries" is a matter of debate. The word carries a negative connotation, and, as many such implicitly normative concepts, it will be essentially contested. In this section, we briefly discuss the most common definition and explain our usage.

According to the definition of the Protocol Additional GC 1977 (APGC77) to the Geneva Conventions,

> a mercenary is any person who: (a) is specially recruited locally or abroad in order to fight in an armed conflict; (b) does, in fact, take a direct part in the hostilities; (c) is motivated to take part

> in the hostilities essentially by the desire for private gain and, in fact, is promised, by or on behalf of a Party to the conflict, material compensation substantially in excess of that promised or paid to combatants of similar ranks and functions in the armed forces of that Party; (d) is neither a national of a Party to the conflict nor a resident of territory controlled by a Party to the conflict; (e) is not a member of the armed forces of a Party to the conflict; and (f) has not been sent by a State which is not a Party to the conflict on official duty as a member of its armed forces.

While this definition is widely accepted, its reference to individual motivations and excess compensation (part c) is problematic since these factors are notoriously hard to observe. Mercenaries should not be specified by reference to why they fight, but by reference to what they do.[4] We therefore define mercenaries as individual soldiers or groups of fighters who receive rewards to actively fight in combat fulfilling conditions (a), (b), and (d)-(f).[5] We focus on the active participation in fighting, and exclude logistical service, training, and other non-combat services.[6] The issues of accountability, control, and regulation that motivate our research seem to us particularly relevant for these activities at the tip of the spear (to use Singer's 2003

[4] This is the position of the Diplock Report in the United Kingdom (Burmester 1978: 72). See also Singer (2004).

[5] Percy (2007, p. 52) argues that taking foreign nationality as a defining characteristic, as in (d) above, narrows the definition of mercenaries to historical contexts where the idea of nationhood makes sense, and thereby excludes many paradigmatic cases. This is not crucial for our study, since we are dealing with the second half of the 20th-century, where nationalities were comparatively well-established. In some wars during the decolonization era the concept of nationality may be difficult to apply. For example, in the case of the Vietnam war, should we consider fighters from mountain tribes as mercenaries? Similar questionable cases arise in Cambodia, Laos, and Chechnya. How one draws the dividing line is, however, not crucial since in all questionable cases we also observe mercenaries with a clearly foreign nationality.

[6] A complementary research strategy is introduced by the Private Security Database (PSD) which collects data on the use of Private Security Companies by focusing on contractual relationships between public and private actors and by incorporating a wide variety of tasks (e.g. logistics support, intelligence, demining) in pre-war and/or post-war situations (Branović 2008)

metaphor).

Permanent members conflict parties' armed forces are not mercenaries, whatever their nationality may be. Moreover, mercenaries are recruited only for particular wars. For these reasons, the Gurkhas regiments enlisted in the British Army do not fall under our definition of mercenaries. Similarly, the French Foreign Legion is organized in units of professional troops integrated into the command structures of the French Army; these troops are not mercenaries according to our definition. They differ in particular with respect to the accountability and control issues central to the debate.

Our definition includes employees of private military companies. This is not to deny that there may be differences between more traditional freelancing mercenaries and today's private military companies, in particular due to the fact that the latter are corporations. The implications of these differences, however, are debated (Musah 2002, Singer 2003, Avant 2006). For example, private military companies themselves argue that they have a reputation to protect, and thereby have incentives to make sure their employees abide by international norms. While some commentators believe this is a crucial difference, others point out that having a reputation for *not* always playing by the rules may actually help private military companies to acquire contracts.[7] The matter is ultimately an empirical question, and our data may be used in future studies to shed light on them. For the present paper, however, we stress that it does not matter how one resolves the issue of whether or not employees of private military companies should be considered mercenaries, because deciding the question either way leads to identical results (see Section 4 below).

2 Theory

Our theory is based on simple demand versus supply considerations: mercenaries will be active if and only if there is some party to the conflict that is both willing and able to pay a price for the support of mercenaries, and

[7] The award of a $293 million contract to Aegis Defense Services in the Iraq war in 2004 may be a case in point (see Avant 2006, p. 226-228).

there are potential mercenaries willing to offer their services for this price.

To fix ideas, consider a simple bargaining model between two players. On the demand side, there is a party to the conflict, e.g. a government or a rebel group. On the supply side, there is a leader of some group of potential mercenaries ("the mercenary" for brevity).[8]

On the demand side, we assume that the party to the conflict is a rational expected utility maximizer. Hiring mercenaries gives an expected utility

$$u^{hire} = p^{hire}v - d - w,$$

where p^{hire} is the probability of winning the war when hiring mercenaries, v is the utility from winning the war, w stands for the payments to the mercenaries, and d denotes indirect costs of hiring the mercenaries. The utility from losing the war is normalized to zero. We assume that after winning the war, the party can appropriate some part of the wealth of the country; therefore the magnitude of v will depend on the wealth of the country. As a proxy for wealth, we consider the GDP of the country. In a country with a high GDP, potential tax revenue is higher, and thereby incentives to win the war are higher. Similarly, if there are natural resources in the conflict area, this will increase the value of securing the area. The indirect costs d capture all costs except expenses directly paid to the mercenaries. For example, hiring mercenaries may worsen one's reputation. The magnitude of d will, in general, depend on what kind of actor the party to the conflict is. Relying on mercenaries may undermine public support and thus lead to a loss of power in a democracy, while having no comparable drawback in a dictatorship. To give an example, the Prime Minister of Papua New Guinea, Julius Chan, was ousted in 1997 after a contract with the private military firm Sandline was leaked to the public (Singer 2003, 191-196).

[8] In reality, of course, there may be several actors both on the demand side and on the supply side. Taking this into account complicates the analysis without generating new insights that are easily testable with our data. Therefore we focus on a model with only two players. We briefly revisit the potential impact of further players when we lay out our hypotheses about external interventions.

If the party decides not to hire mercenaries, it gets

$$u^{nohire} = p^{nohire} v.$$

In the model, the effect of mercenaries on the outcome of the war is captured by the difference between p^{hire} and p^{nohire}. If $p^{nohire} \geq p^{hire}$, there is no reason to hire mercenaries, since they decrease the chances to win. If $p^{hire} > p^{nohire}$, the party to the conflict has to trade off the benefit of having a higher chance to win against the direct cost w and the indirect cost d.

In times of war, governments and rebel groups are often financially constrained in their choices. We assume that the party has a budget b available, and is unable to pay more than b for the mercenaries. The magnitude of b may depend on tax revenue, and thereby indirectly on the GDP, but also on the presence of natural resources. Moreover, if the party has the backing of a foreign country, this may increase its financial capacity. An example for these considerations is Sierra Leone. According to Shearer (1998, p. 52), its contracts with the private military company Executive Outcome were tailored to take into account Sierra Leone's ability to pay. Moreover, a significant part of the income of Sierra Leone in 1995 came from IMF loans, and the IMF had approved using part of Sierra Leone's overall budget for payments to Executive Outcomes (Shearer 1998, p.53).

On the supply side, we assume that the mercenary is a rational expected utility maximizer, too. If he stays out of the war, he gets his reservation utility $\bar{u}$. The value of $\bar{u}$ might depend, for example, on alternative employment opportunities. The expected utility from participating in the war is $w - c$, where w is the wage that the mercenary receives, and c is the cost of participating in the war. The parameter c captures the risk of participating for the mercenary leader himself, and costs for the recruitment, training, and equipment of personnel. It may depend on the mercenary's former experiences. For example, many employees of the private military firm Executive Outcomes were former members of elite units of the apartheid-era South African Defence Forces, and had first-hand experiences from fighting in Angola, where they later fought as mercenaries (Singer 2003). Such previous

experiences may drive down the costs of participating in a war.

To close the model, we assume that the party and the mercenary bargain efficiently. Therefore, the mercenary will be active in the war if, and only if, the players can find some price $\hat{w}$ for his services that fulfills three conditions:

1. the mercenary is willing to fight for $\hat{w}$, i.e.

$$\hat{w} - c \geq \bar{u},$$

2. the party to the conflict is willing to pay $\hat{w}$, i.e.

$$p^{hire}v - d - \hat{w} \geq p^{nohire}v$$

3. the party to the conflict is able to pay $\hat{w}$, i.e. $\hat{w} \leq b$.

Now suppose that one parameter of the model is exogenously changed, and consider whether it gets more or less likely that the mercenary will be fighting in the war: does the set of values for the remaining parameters, such that the mercenary will be active, get larger or smaller?

Proposition 1 *The probability that the mercenary is actively participating in a given war increases in* $p^{hire} - p^{nohire}$, v, *and* b; *it decreases in* d, $\bar{u}$, *and* c.

Proof. By condition 1 above, the smallest wage that the mercenary could accept is given by $\bar{u} + c$. By condition 2, the highest amount that the party is willing to pay is $\left(p^{hire} - p^{nohire}\right) v - d$. Taking into account the budget constraint b leads to the conclusion that the mercenary will be active if and only if

$$\min\left\{\left(p^{hire} - p^{nohire}\right) v - d, b\right\} \geq \bar{u} + c.$$

The left hand side is weakly increasing in $p^{hire} - p^{nohire}$, v, and b; it is weakly decreasing in d. Moreover, the right hand side is increasing in $\bar{u}$ and c. ■

Proposition 1 states that mercenaries are more likely to be active whenever they increase the chances of winning a lot ($p^{hire} - p^{nohire}$ is high), the

incentives to win v are high, and the budget constraint is not very tight (b is high). On the other hand, mercenaries are less likely if their cost from participating c are high, if they have good outside opportunities $\bar{u}$, and if the indirect costs of hiring mercenaries d are high.[9]

3 Hypotheses

We now turn to the testable implications of the model. The financial capability (and thus ability to pay b) of a party to the conflict depends on GDP. Moreover, the willingness to pay may be increasing in income, too: as argued above, v will be higher in richer countries. This leads to our first hypotheses:

> H1: A higher GDP leads to a higher probability of mercenary involvement.

Natural resources may also increase both the willingness and ability to pay for mercenaries. Natural resources make mercenaries more valuable, if

[9] The model makes no exact prediction about the price that the mercenary and the party to the conflict will agree on, except that it fulfills conditions 1-3. To get a more specific prediction, some assumption on the bargaining power of the mercenary and the party to the conflict needs to be made. For concreteness, assume that the parties split the surplus according to the generalized Nash bargaining solution. Let $m \in (0,1)$ denote the bargaining power of the mercenary. Then the equilibrium wage maximizes the Nash product

$$(w - c - \bar{u})^m \left(p^{hire} v - d - w - p^{nohire} v\right)^{1-m}$$

subject to

$$w \in \left[\bar{u} + c, \min\left\{\left(p^{hire} - p^{nohire}\right) v - d, b\right\}\right].$$

The solution is

$$w = \min\left\{m\left(\left(p^{hire} - p^{nohire}\right) v - d\right) + (1-m)(c + \bar{u}), b\right\}.$$

Thus, the model predicts that, unless the budget constraint is binding, the wage of mercenaries will be a weighted average of the party to the conflict's maximal willingness to pay, and of the minimal wage that the mercenary is willing to accept. The model is consistent with recent experiences in Iraq, where prices for security personnel are reported to have fluctuated with the intensity of suicide bombings and roadside bombs (The New Republic, August 27, 2008). In terms of the model, more suicide bombings increase c, the wage therefore increases. The exact wage, however, is not at the center of our interest, since payments for mercenaries are not captured in our data.

they help to win the war and establish control over these resources; thus the willingness to pay may be higher. In terms of the model, v will be higher. Moreover, natural resources increase the ability of parties to the conflict to pay for mercenaries. In times of war, revenue from taxation may be small and uncertain; in contrast, natural resources can generate dependable revenue for parties to the conflict. In some cases, mercenaries have been paid for in what Ross terms "booty futures" - rights to exploit mineral resources that are not currently under control of the seller (Ross 2004). In terms of the model, b will be higher if there are natural resources. We focus on the impact of diamonds and oil. This focus is motivated by three reasons. First, there are indications from case studies that diamonds and oil have been involved in the remuneration of mercenaries (Musah and Fayemi, 2000, p. 23). As Shearer (1998, p. 40) argues that "mineral wealth is one of the few means available by which developing countries can afford the services of an outside force". Naturally, one would like to know whether this is a general pattern. Second, there is sufficient variation in these variables to get a decent estimate of their impact. Neither oil nor diamonds are geographically concentrated in a few countries; moreover, diamonds and oil have been valuable during all the decades we study. Third, good data on oil and diamonds are available.

H2: Diamonds increases the probability of mercenary involvement.

H3: Oil increases the probability of mercenary involvement.

In many civil wars, outside forces intervene militarily. Military interventions by regular troops must be distinguished from mercenaries, who are by definition not members of regular troops. The presence of an outside intervention shows that there is a foreign country, or a coalition of countries, that has a high stake in the conflict. We conjecture that, therefore, the probability of mercenary involvement will be higher. First, the intervening power is likely to provide financial assistance to a party to the conflict, and thereby increase its ability to pay for mercenaries b. Second, the intervening power itself may hire mercenaries. This can be advantageous for several reasons:

to reduce the risk of casualties of own troops, to circumvent political control inside the intervening country, and to be able to disclaim responsibility if things go wrong.[10]

> H4: Interventions increase the probability of mercenary involvement.

Our next hypotheses considers the impact of regime type. We argue that, in a democracy, the indirect costs of hiring mercenaries d will be higher. A democratic government that relies on mercenaries will suffer costs to its reputation and a deterioration of its popular support and reelection chances. In an autocracy or a dictatorship, power will be based on other sources that may be less affected by hiring mercenaries.

> H5: In wars in democratic countries, mercenaries are less likely.

We now consider the supply side. In times when many trained military professionals lack other good opportunities, they may offer their services on the market (Singer 2003). The outside option $\bar{u}$ of mercenary leaders, and similarly the costs or recruitments captured in c, will be lower if regular militaries are downsizing. This leads to the following hypotheses:

> H6: A downward change in troop levels in the years preceding a conflict increases the probability of mercenary involvement.

The market for mercenaries seems to be quite international. Often individuals from one continent fight on another. This suggests to study the effect of a change of global troop sizes. On the other hand, changes in troop size levels in the countries in geographic proximity may have a stronger effect. Therefore, we also consider a measure of changes of regional troop sizes.

[10] For example, Shearer argues that, in Bosnia and Angola, the involvement of the private military firm MPRI allowed the US government "to achieve foreign-policy goals free from the need to secure Congressional approval and safe in the knowledge that, should a situation deteriorate, official US participation can be denied" (Shearer 1998, p. 62).

4 Empirical specification

The considerations above suggest that the willingness and ability to pay for mercenaries is a function of the GDP, natural resources, and interventions, but negatively related to democracy.

$$w_D = \alpha_D + \beta_1 GDP + \beta_2 Dia + \beta_3 Oil + \beta_4 Interv + \beta_5 Demo + \varepsilon_D$$

Here, w_D is the maximum willingness and ability to pay for mercenary services by any party to the conflict. The term ε_D is an error term. We expect β_1 to β_4 to be positive and β_5 to be negative.

Moreover, the supply of mercenaries is related to the change in global troop size.

$$w_S = \alpha_S + \beta_6 TroopDecr + \varepsilon_S$$

The minimum price at which some potential mercenaries are willing to offer their services is lower if global troop size have decreased, thus we expect $\beta_6 < 0$.

Mercenaries will be active if and only if $w_D > w_S$. Thus, the probability that mercenaries are involved in a given war is

$$\Pr(Merc = 1) = \Pr(w_D > w_S) =$$
$$= \Pr(\alpha + \beta_1 GDP + \beta_2 Dia + \beta_3 Oil + \beta_4 Interv + \beta_5 Dem + \beta_6 TroopIncr > \varepsilon) \quad (1)$$

where $\alpha = \alpha_D - \alpha_S$, $\varepsilon = \varepsilon_S - \varepsilon_D$, and $TroopIncr = -TroopDecr$. Assuming that the error terms follow an extreme value type I distribution (or, alternatively, a normal distribution), one can estimate the equation by logit (probit). Equation (1) is the main equation that we estimate. While our hypotheses were developed by thinking about demand and supply, given the nature of our data we do not attempt to identify demand and supply separately.

5 Data sources and descriptive statistics

Unit of observation The unit of observation is an internal war year. We use the Consolidated List of Wars, which collects war data on a state-year basis and builds on the common rule that a classification of war is best arranged according to the political status of the protagonists , but includes additional information (Chojnacki 2006; Chojnacki & Reisch 2008). In particular, the Consolidated List of Wars adjusts the conventional focus on inter-, extra- and intra-state wars by taking into account sub-state wars, which are defined as organized violence between non-state or non recognized quasi-state groups, whether within or across formal state boundaries. In our data, there are 15 sub-state wars, in 6 of which mercenaries are active. This proportion is higher than in other types of wars and therefore it is important to account for sub-state wars in our analysis. We refer to intra-state and sub-state wars as internal wars.[11]

Dependent variable Our dependent variable is a binary indicator which takes the value one if mercenaries are involved in combat, and zero otherwise. Our data are based on a systematic analysis of all the articles published in five major US newspapers (New York Times, Washington Post, Los Angeles Times, Christian Science Monitor, and Wall Street Journal) containing the words "mercenary/ies", "private military firm/s" and "private military company/ies" between January 1, 1946, and December 31, 2003. Selection criteria were the reputation of the international news coverage and electronic access making easy replication and validation of the data set possible. The search resulted in nearly 25,000 articles of which about 500 contained relevant information and were integrated in the data set. In about one-third of all cases of mercenary involvement our sources also included some estimates on how many mercenaries were involved. In the remaining cases this information is not available. Due to this limitation

[11] The definition of internal wars (intra-state and sub-state) requires that the conflict resulted in at least 1000 military or civilian deaths over its entire duration. In order to rule out massacres, sporadic violence, and terrorist attacks, there have to be at least 100 deaths per year on both sides.

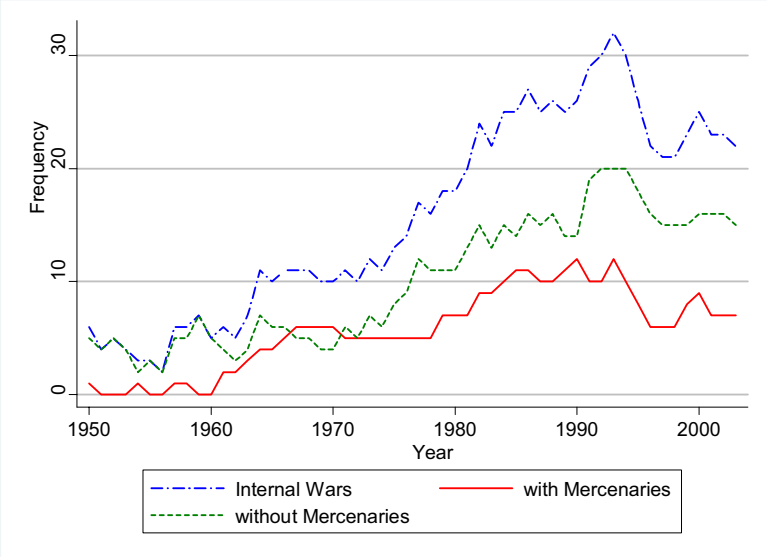


Figure 1: Ongoing internal wars with and without mercenaries, 1950-2003

we use a binary variable as our dependent variable.

Our data set comprises 126 observations of internal wars in 1946-2003. Mercenaries were involved in 43 cases, listed in Table 13 in the appendix. Due to missing observations on independent variables, the sample used for estimation includes 104 cases in the years 1950-2000. Out of these 104 observations, mercenaries were active in 37 cases.

Figure 1 plots the number of ongoing internal wars over time, differentiating between wars with and without mercenaries. The total number of wars is increasing until the early 1990s and dropping afterwards. This is in line with findings from other datasets (Collier and Hoeffler 2007). The number of wars with mercenaries moves roughly in proportion to the total number of wars.

Figure 2 describes the distribution of wars over five different regions: South America, Europe, Africa, Middle East, and Asia. Africa has the highest number of wars in total among the regions, followed by Asia. Almost one half of our observations with mercenary involvement are located in

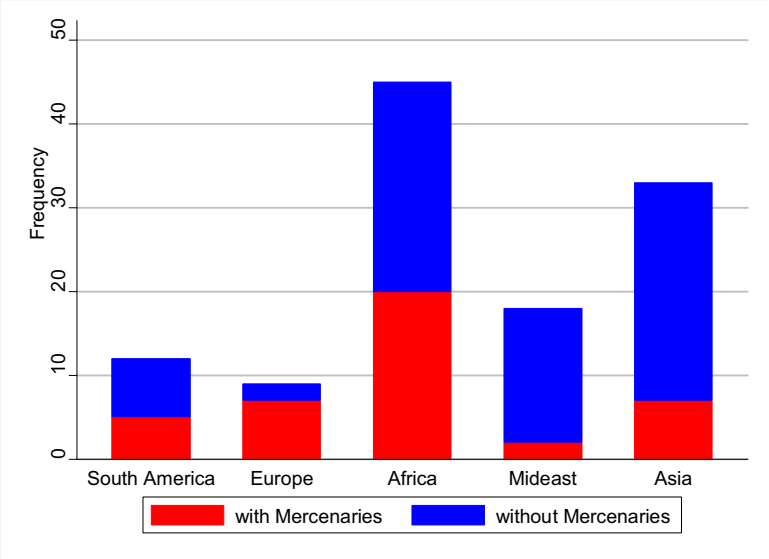


Figure 2: Internal wars with and without mercenaries by region, 1950-2003

Africa, the remaining cases are distributed across the other regions. Europe has the highest proportion of wars where mercenaries are involved.[12]

Dependent variable: discussion One might worry whether the use of the word "mercenary" has changed during the 50 plus years we cover. Studying the definition of "mercenary" in various editions of Webster's dictionary, however, gives no support for such a change in meaning.

As mentioned above, our definition of mercenaries is meant to include several cases of employees of private military companies. In light of the discussion in the literature concerning the differences between private military companies and "traditional" mercenaries, we collected information from our sources whether the persons in question were employees of private military companies. In our data, it turns out that in every conflict where private

[12] Only in the war in South Ossetia (Georgia 1991) we have no reports of mercenaries. The wars in Europe with mercenaries are Croatia (1991-94), Bosnia and Herzegovena (1992-95), Serbia and Montenegro (1998-00), Russia (Chechnya 1994-96 and 1999-2003), Georgia (Abkhazia 1992-93), Azerbaijan (Nagorno-Karabakh 1992-94).

military companies were actively involved in combat, there have also been reports of traditional freelancing mercenaries. Thus, the results of our study would not change if we excluded employees of private military companies.

To shed some light on the reliability of our data, we compare them to the list of mercenary activities found in Musah and Fayemi (2000). This list is based on a number of case studies on mercenaries and builds on a larger set of sources than our data, including local newspapers and historical accounts. It is, to our knowledge, the only published list of mercenary activities so far, and has been influential in the debate.[13] The focus of Musah and Fayemi's list is on Africa from 1950 to 1998, with a strong emphasis on the 1990s. It is thus more limited in scope than our data which systematically cover the whole world. On the other hand, Musah and Fayemi collected information not only on combat activities, but also on other military services involving logistical support or military advice, even in times of peace. There is only one war (Uganda 1997-1998) where, according to Musah and Fayemi (2000), mercenaries actively fought in combat, but according to our data no mercenaries participated. This comparison shows that, while our data are not measured perfectly, we reassuringly miss only one single case by basing our analysis on US newspaper reports. Moreover, we find nine additional cases of mercenaries fighting in Africa 1950-1998, which are not reported in Musah and Fayemi (2000). This is probably due to the fact that their list is a summary of several case studies, rather than the result of a systematic search for all cases of mercenary activities.

Independent variables *GDP* is real GDP per capita in the year preceding the start of the war. For the estimations, we measure it in 1000 US$. Data on GDP and population are from Gleditsch (2002). These data are based on the PWT (Summers and Heston 1991) and include additional information from the CIA World Factbook 1998 to reduce the problem of missing data. In the sample used for estimation, GDP ranges from 67.27

[13] For example, this list is reprinted in the green paper of the UK government "Private Military Companies: Options for Regulation".

(US $ per year, China in 1956[14]) to 8504.06 (Russia 1994), with an average of 1326.069, median of 731.69, and a standard deviation of 1435.314. In our data, India in 1990 is close to the average GDP per capita (1443.95); Liberia in 1990 is close to the median (753.16). A few comments are in order. First, all countries in our sample are comparatively poor, which is in line with the literature linking GDP and civil war (Hegre and Sambanis 2006). Still, among the countries there is variation in the GDP, and we conjecture that parties to the conflict in richer countries are more likely to hire mercenaries. Second, one might worry about endogeneity. We focus on pre-war GDP to ameliorate this concern. Moreover, our dependent variable is mercenary activity, and it seems less an issue that mercenary activity may have an impact on pre-war GDP, than that civil war by itself has an impact on GDP (see Miguel, Satyanath, and Sergenti 2004).

Diamonds is the number of lootable and non-lootable diamond mines per country, taken from the DIADATA data set (Gilmore et al 2005). In more than half of all observations there are no diamond mines. The average number of mines is 6.46 (for example, China has 8), and the standard deviation 13.39. The highest number of mines has South Africa (88), which is somewhat of an outlier: the second highest number of mines is 48 in Angola (and Guinea, but this is not in the estimation sample), followed by 33 in Congo. In order to avoid results being driven only by a single data point, we also run regressions where we exclude South Africa. Similarly, in a further robustness check we exclude both South Africa and Angola.

Oil is the number of on-shore and off-shore oil sites taken from PETRODATA (Lujala, Rod, and Thime 2007). Oil ranges from 0 to 114 (Russia), with an average of 13.59 (Iraq has 13) and a median of 4 (e.g., Bolivia) and a standard deviation of 24.12. Inspecting the oil variable reveals that the countries with the highest number of oil sites (Russia: 114, China: 89, and Indonesia: 63) may be outliers, since most of the data are concentrated between 0 and 27 (Iran, the fourth highest number of oil fields). To see whether our are driven by these extreme cases, we also run regressions where we suc-

[14] This year refers to the first year of the war. Keep in mind that the GDP is lagged, so the number for China refers to the GDP in 1955.

cessively exclude Russia, China, and Indonesia. In addition, we experiment with the oil dummy used in Fearon and Laitin (2003).

Intervention data are from Regan (2002). We use a binary indicator for military interventions by troops and naval troops. On the sample used for observation, we have 47 interventions in 104 cases. As a robustness check, we also run a regression with the COW intervention data (Sarkees and Schafer 2000).

Democracy is a dummy variable based on the Polity IV dataset (Marshall and Jaggers 2000), version 2007. We use the polity2 score in the year preceding the war to construct the democracy dummy, which takes the value one if the polity2 score is greater than 6. Among our observations, 15% are democracies.

Troop increase is computed using the Correlates of War National Capability Data (Sarkees and Schafer 2000). The variable is the increase of world-wide troop size during the four years preceding the conflict, measured in units of one million soldiers. It ranges from -5.252 (in 1994) to $+5.341$ (in 1953), with a mean of 0.1744, a median of 0.584, and a standard deviation of 0.206. In the robustness section, we also report results from regional changes of troop size, and from taking a shorter time window.

6 Results

Table 1 reports results from a logistic regression of equation (1). Since different wars in the same country may well be related, we cluster standard errors on the country level, to account for possible country specific heterogeneity.[15] Model 1 is our basic specification, without further controls. Model 2 adds a dummy for regions. Mercenary activity is often thought to be especially pronounced in some regions, most notably in Africa. Therefore it seems important to control for regions, in order to see whether the effects could be driven by some unobserved factors pertaining to the regions. The reference

[15] Another strategy would be to use country fixed effects, which however would lead to problems due to the limited number of cases. As a robustness check, we also estimated with probit, a linear probability model, and a logit without clustering standard errors. The results are similar.

category is Europe. Model 3 adds dummies for decades, where the reference category are the 1990s. Controlling for time effects seems important because the GDP is, on average, growing over time. The GDP variable may simply pick up a pure time trend, if this is not otherwise controlled for. Model 4 controls for both regions and decades. Significance levels are based on $p-$values from two-sided tests. At the bottom, we report the number of observations, the number of explanatory variables, and the value of the maximized log-likelihood.

Sign and statistical significance We start by describing the sign and statistical significance of the effects. *GDP per capita* has the expected positive sign and is statistically significant in all specifications except Model 2. *Diamonds* has the expected positive sign and is statistically highly significant in all four models. *Oil* has an unexpected negative coefficient, it is statistically significant in all specifications except Model 2. *Interventions* has the expected positive coefficient and is highly significant in all specifications. *Democracy* has the expected negative sign; however it is not statistically different from zero. *Troop Increase* has an unexpected positive sign but is never statistically significant. Turning to the *regions*, the sign of the coefficients is negative in each case. As described above, the omitted category is Europe, where the proportion of wars with mercenaries is particularly high (see Figure 2). Among the regions, the coefficients suggest that mercenaries are most likely in Europe, followed by South-America and Africa, and less likely in Asia and the Mid-East. The dummies are not, however, statistically significant at conventional levels. On *decades*, the most interesting finding is that the dummy for the 1960s is positive and statistically highly significant. This is in line with popular perceptions of mercenary activities being pronounced in the 1960s. The other decades do not differ significantly from the 1990s, and the sign is positive in each case. Given the literature on the transformation of the market for force, this finding is somewhat surprising. Many commentators have argued that the post Cold War era has been marked by a privatization of military affairs; one would thus expect the incidence of mercenaries to be higher in the 1990s. In

Table 1: Main regressions

	Model 1	Model 2	Model 3	Model 4
GDP per capita	0.623**	0.352	0.886**	0.821**
	(0.267)	(0.349)	(0.309)	(0.351)
Diamonds	0.090**	0.075**	0.100**	0.085**
	(0.029)	(0.027)	(0.034)	(0.030)
Oil	-0.039**	-0.032	-0.049**	-0.046**
	(0.018)	(0.018)	(0.019)	(0.019)
Interventions	1.578**	1.495**	1.575**	1.480**
	(0.536)	(0.561)	(0.543)	(0.573)
Democracy	-0.561	-0.682	-0.382	-0.572
	(0.592)	(0.642)	(0.636)	(0.689)
Troop increase (5y)	0.202	0.189	0.145	0.082
	(0.138)	(0.135)	(0.174)	(0.176)
Africa		-2.246		-1.515
		(2.247)		(2.177)
Mideast		-3.467		-3.444
		(2.117)		(2.132)
South America		-1.914		-2.162
		(2.135)		(2.146)
Asia		-2.455		-1.851
		(2.214)		(2.148)
1950s			1.170	2.123
			(1.278)	(1.527)
1960s			1.859**	2.449**
			(0.902)	(1.019)
1970s			0.693	1.378
			(0.932)	(0.981)
1980s			0.220	1.015
			(0.914)	(1.022)
Constant	-2.281**	0.426	-3.217**	-1.631
	(0.570)	(2.410)	(1.015)	(2.305)
Observations	104	104	104	104
Df	6	10	10	14
Log likelihood	-53.70	-49.86	-51.21	-47.24

** p<0.05, * p<0.01

Robust standard errors in parentheses

GDP	+0.2122
Diamonds	+0.2062
Oil	−0.2009
Interventions	+0.3403

Table 2: Change in predicted probability of mercenaries for a one standard deviation increase of the GDP, Diamonds, and Oil. Change in predicted probability due to an intervention. All other variables are held constant at their median.

our data, however, the probability that mercenaries participate in a given war is no higher in the 1990s than in previous decades. For interpreting this finding, one should keep in mind that our dependent variable is only a binary indicator; it may still be true that the total number of mercenaries involved in these wars have increased.

Size of the effects Table 2 reports the change in predicted probability as a variable changes from 1/2 standard deviation below its median to 1/2 unit above, holding all other variables at their median. For the binary variable *Interventions*, Table 2 reports the change in predicted probability for a war with, rather than without, an intervention. GDP and Diamonds increase the probability of mercenaries by approximately 20 percentage points, Oil decreases it by roughly the same amount. The effect of interventions is particularly strong. Holding all other remaining variables at their median, an intervention more than doubles the probability of mercenaries: it increases from 24% to 58%.

To give more details, Table 3 illustrates the effect of the GDP and interventions. It tabulates the predicted probabilities for some interesting values of the GDP, both for a war with and without an outside intervention, holding the remaining variables constant at their median.[16] In a war without an intervention, raising the GDP from its minimum to the mean more than

[16] Concerning the dummies for regions and decades, the median value is zero, thus the predicted probabilities are for a country in the reference category. The median of the democracy is zero. Thus the predicted probabilities correspond to a non-democratic country in the Nineties in Europe.

GDP in $	Intervention	
	No	Yes
67.27 (China 1956, the min)	0.1528	0.4420
753.16 (Liberia 1990, close to the median)	0.2405	0.5819
1443.95 (India 1990, close to the mean)	0.3584	0.7105
4451.76 (Algeria 1992)	0.8658	0.9667
8504.06 (Russia 1994, the max)	0.9946	0.9988

Table 3: Predicted probability of mercenaries for different values of GDP, without and with an intervention

doubles the estimated probability of mercenaries. Raising it still higher to the maximum again more than doubles it from the level it has at the mean. Of course, these are extreme variations of the GDP as they involve the whole range of our observations. But they indicate that the effect of GDP on mercenaries is substantive. In a war with an intervention, the effect is not as strong since even with the GDP at its minimum, the predicted probability is almost one half. Nevertheless, the effect is sizeable here as well. For most levels of GDP, an intervention doubles the probability of mercenaries; with the exception of countries with a high GDP, where the probability of mercenaries is high even without an intervention.

Table 4 illustrates the size of the effects of diamonds and interventions, holding all other variables constant at their median. Again, we find that the effects are strong. For example, if there is no intervention, compared with a country without diamonds, a country that has the same number of diamond mines as Sierra Leone has a three times higher probability of mercenary involvement.

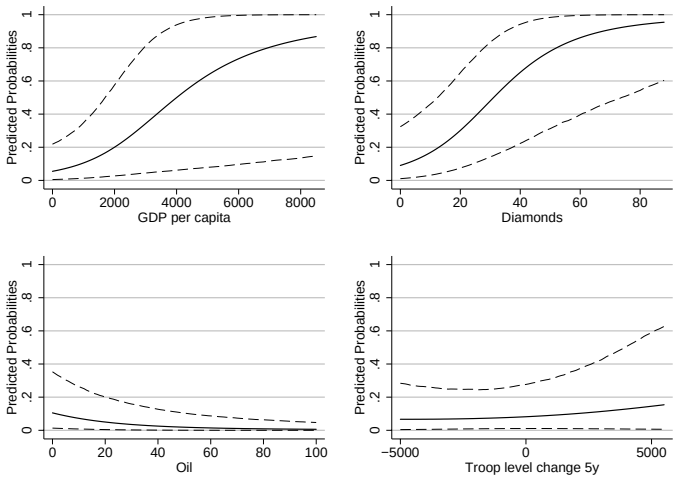
Figure 3 gives a further illustration of the size of the effects by plotting the predicted probability of mercenaries as a function of GDP, Diamonds, Oil, and Troop Increase, together with 95% confidence intervals. Here the predicted probabilities are for a country in Africa. All other variables are held constant at their median.

Overall fit and quality of the model To get an impression of the overall fit of the model, we cross-tabulate correctly and incorrectly classi-

Diamonds	Intervention	
	No	Yes
0 (the min and the median)	0.2373	0.5776
8 (China, close to the mean)	0.3814	0.7304
14 (Indonesia)	0.5074	0.8190
26 (Sierra Leone)	0.7418	0.9266
33 (Sudan)	0.8394	0.9583
48 (Angola)	0.9496	0.9881
88 (South Africa)	0.9983	0.9996

Table 4: Predicted probability of mercenaries for different numbers of diamond mines, without and with an intervention

Figure 3: Predicted probabilities of mercenaries as a function of independent variables, for a country in Africa with 95 percent confidence intervals



		Observed		
		M	$No\ M$	Total
Classified	M	23	7	30
	$No\ M$	14	60	74
	Total	37	67	104

Table 5: Correctly versus incorrectly classified observations

fied observations according to Model 4. An observation is classified as M (for Mercenaries) if the predicted probability of mercenaries is greater than 1/2. The model classifies 4 out of 5 of the observations correctly (79.81%). This is substantively better than the naive prediction that there will be no mercenaries in any war, which classifies 2 out of 3 correctly (67/104).

More on interventions The strong effect of interventions suggests taking a closer look. We distinguish between UN interventions and other interventions. Out of the 47 interventions in our 104 observations used in the estimations, there are 40 non-UN interventions and 7 UN interventions (Cyprus 1964, Cambodia 1979, Rwanda 1990, Iraq 1991 (Shiites), Iraq 1991 (Kurds), Somalia 1992, Serbia and Montenegro 1998). In these seven cases with UN interventions, only in Serbia and Montenegro were mercenaries active, according to our data.[17] In the regressions, we cannot include controls for regions, since then some observations are completely determined. Table 6 reports the regression results. The first column reproduces Model 3 to ease comparison. Model 5 has two separate dummies for interventions, one for UN and one for Non-UN interventions; the reference category consists of wars without any intervention. UN interventions are insignificant, and their sign is negative - if anything, they are associated with fewer mercenaries. Non-UN interventions have a positive sign and are highly significant. The magnitude of the coefficient is somewhat higher than in Model 3, which makes sense since the UN interventions have a negative sign. Model 6 drops the variable UN-interventions. Results are similar. Thus, it seems that the

[17] In the full sample, we have one additional UN intervention, Bosnia and Hercegovina 1992, and in this case mercenaries were active as well.

Non-UN interventions drive our result.

Moreover, we investigate whether US interventions differ. We have 37 non-US and 10 US interventions. There is some overlap between UN and US interventions (3 cases: Iraq 1991, Iraq 1991, Somalia 1992), in none of these cases do we observe mercenaries. We have 3 cases of mercenaries in wars with a US intervention: Vietnam 1960, Colombia 1965, Cambodia 1970.[18] Model 7 in Table 6 differentiates between US and Non-US interventions. The sign of the coefficient of US interventions is positive. However the coefficient is not statistically significant. Its absolute value is about one half of the value of the coefficient of Non-US interventions, which is highly significant and somewhat higher than in Model 3. Model 8 drops US interventions, results are similar. We conclude that our findings on interventions are not mainly driven by US interventions.

In Table 7 we report a robustness check that uses the COW data for the intervention variable. This has the drawback that we lose about 40% of our observations. We cannot control for regions since otherwise some observations are completely determined. The first two columns reprint Models 1 and 3 to ease comparison. Model 9 has no controls for regions or decades. Model 10 ads controls for decades. Interventions are not significant in Models 9 and 10. It should be observed, however, that we have only 62 observations in this regression, so the lack of significance may just be due to the limited number of observations. It is reassuring to note that the sign of the coefficient on interventions is positive, and even the value is similar to that obtained in our previous results.

7 Robustness checks

In this section we report several robustness checks. All regression tables are in the appendix.

[18] In addition, there was a US intervention in China in 1946, but this is not in the estimation sample due to missing values on other exogeneous variables.

Table 6: Interventions: UN, US, and other

	Model 3	Model 5	Model 6	Model 7	Model 8
GDP per capita	0.886**	0.910**	0.913**	0.905**	0.884**
	(0.309)	(0.323)	(0.319)	(0.313)	(0.305)
Diamonds	0.100**	0.091**	0.092**	0.097**	0.090**
	(0.034)	(0.033)	(0.032)	(0.034)	(0.030)
Oil	-0.049**	-0.051**	-0.051**	-0.050**	-0.049**
	(0.019)	(0.021)	(0.021)	(0.019)	(0.019)
Interventions	1.575**				
	(0.543)				
UN Interventions		-0.257			
		(1.134)			
Non-UN Interventions		1.838**	1.873**		
		(0.600)	(0.597)		
US Interventions				0.849	
				(0.904)	
Non-US Interventions				1.776**	1.586**
				(0.560)	(0.528)
Democracy	-0.382	-0.385	-0.397	-0.288	-0.178
	(0.636)	(0.710)	(0.718)	(0.598)	(0.600)
Troop increase (5y)	0.145	0.197	0.195	0.139	0.122
	(0.174)	(0.179)	(0.180)	(0.179)	(0.180)
Controls for Regions	no	no	no	no	no
Controls for Decades	yes	yes	yes	yes	yes
Constant	-3.217**	-2.835**	-2.904**	-3.253**	-3.043**
	(1.015)	(1.011)	(0.935)	(1.032)	(0.994)
Observations	104	104	104	104	104
Log likelihood	-51.21	-49.32	-49.35	-50.58	-51.03
Df	10	11	10	11	10

** p<0.05, * p<0.01

Robust standard errors in parentheses

Table 7: Interventions: COW data

	Model 1	Model 3	Model 9	Model 10
GDP per capita	0.623**	0.886**	0.893**	1.456**
	(0.267)	(0.309)	(0.332)	(0.496)
Diamonds	0.090**	0.100**	0.069	0.110
	(0.029)	(0.034)	(0.052)	(0.066)
Oil	-0.039**	-0.049**	-0.066**	-0.099**
	(0.018)	(0.019)	(0.028)	(0.037)
Interventions	1.578**	1.575**		
	(0.536)	(0.543)		
COW interventions			1.125	1.411
			(0.706)	(0.773)
Democracy	-0.561	-0.382		
	(0.592)	(0.636)		
Troop increase (5y)	0.202	0.145	0.133	0.133
	(0.138)	(0.174)	(0.213)	(0.315)
Controls for Regions	no	no	no	no
Controls for Decades	no	yes	no	yes
Constant	-2.281**	-3.217**	-1.836**	-3.851**
	(0.570)	(1.015)	(0.690)	(1.331)
Observations	104	104	62	62
Log likelihood	-53.70	-51.21	-34.45	-31.37
Df	6	10	5	9

Robust standard errors in parentheses

** p<0.05, * p<0.01

Substate wars A distinguishing feature of our data on wars is that they comprise a class of substate wars, where mercenaries are often involved. To see whether the type of war makes a difference once we control for other factors, we run regressions with a dummy on substate wars. Table 8 reports the results, where the first two columns reprint Models 1 and 4 for comparison. The dummy is negative but not statistically significant at conventional levels, which may derive from the low number of substate wars. The other parameter estimates do not change a lot, which is reassuring.

Diamond outliers. As noted above, the highest values of diamond mines can be found in South Africa and Angola. To make sure that our results are not driven by a few observations where the count variable Diamonds has a particularly high value, Table 9 successively excludes South Africa and Angola. Results are stable.

Oil Figure 4 shows the number of observations corresponding to a given number of oil sites. There are only three countries with more than 30 oil sites: Indonesia (63 oil sites), China (89), and Russia (114). In Russia, there have been two wars (Chechnya 1994-96 and 1999-2003), mercenaries have been involved in both. In the three observations on China, in one case mercenaries are involved. In the seven observations on Indonesia, mercenaries were not involved in any case at all.

In Table 10, we successively exclude these countries, to see whether our results are driven by these outliers. While the parameter estimate is stable, it is interesting to note that oil is not significantly different from zero in Model 17, which excludes Russia, China, and Indonesia. In fact, just removing Indonesia has the same effect. The significance of oil in our main regressions is driven by a single country.

As a further robustness check, we replaced our oil variable by the oil dummy from Fearon and Laitin (2003). This dummy is for countries that have more than 30% of their exports in oil, and thus picks up the major oil exporters. We lose 10 observations. Results are roughly similar to our main regression, however the oil variable is not statistically significant.

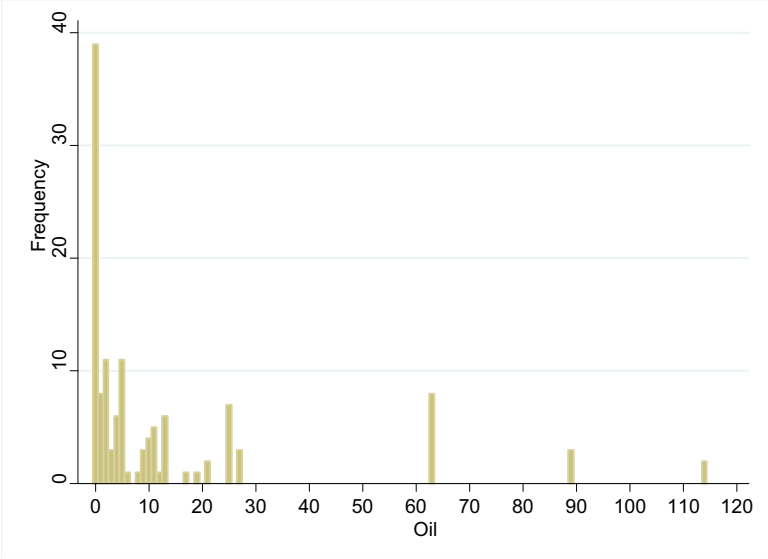


Figure 4: The frequency of observations for a given number of oil sites.

Change of troop size. Our last modification of the main regression concerns the Troop Increase variable. We experiment with a similar variable that measures the change of troop size in the region where the war took place, distinguishing between America, Africa, Asia, Europe, and the Mid-East ("Troop increase reg 5y" in Model 18). Moreover, we construct a variable for troop increase during a shorter two-year time period before the beginning of the war, both globally ("Troop increase 2y" in Model 19) and in the region ("Troop increase reg 2y" in Model 20). Table 12 reports the result. The troop increase variable is never statistically significant. It is, however, interesting to note that the sign of the troop increase in the short time span is positive (Model 19 and Model 20), which is more in line with our expectations.[19]

[19]If one country decreases its troops, while another country increases its troops by the same number, this is netted out in the troop increase variable. Still one might argue that the supply of mercenaries has increased, after all, the former soldiers from the first country are looking for a job, and are unlikely to be hired in the second country. To take this into account, we constructed another variable, where we only consider troop decreases,

8 Conclusion

Mercenaries are widely debated, both in academic and policy discussions, and many case studies and historical accounts are available in the literature. Our knowledge about the market for force is nevertheless limited since there are no quantitative studies so far, which is presumably due to poor data availability. This paper presented a quantitative study of the determinants of mercenary activities in civil wars in the second half of the 20th century. We presented a new dataset based on a systematic analysis of all articles published in five major newspapers containing keywords such as "mercenary/ies". We used our data to test several hypotheses derived from a simple game-theoretic model of demand and supply in the market for violence. Our main findings are that mercenaries are more likely to participate in wars in countries with higher GDP and in particular with diamond mines. Moreover, military interventions by regular troops strongly increase the probability of mercenary activities. UN interventions, however, are an exception: if at all, they seem to be associated with a lower probability of mercenaries.

We conclude by discussing the limitations of our study and avenues for future research. While our research presents the first dataset on mercenary activity that systematically covers the whole world, and brings out interesting patterns in the data, our data are not well-suited to trace out more dynamic processes. Future research has to address the timing of mercenary interventions and how they relate to conflict dynamics. Relatedly, there are issues of endogeneity, in regard to interventions and mercenary activity. Interventions might be a consequence of mercenary activity, even though there is little evidence supporting such an argument. The relationship between interventions and mercenary activity is a motivation for further research. Additionally, we have investigated a very specific form private involvement in warfare. Active participation in combat is an important part of private support to fighting parties, but logistical support or reconnaissance may be

counting any increase in a country as similar to no change of troop size in this country. Results are similar to our findings reported above.

driven by very different factors. Finally, we have not investigated the consequences of mercenary activity on, for example, conflict duration, intensity or outcome. We hope our data will be useful to shed light on these issues in future studies.

A Tables

Table 8: Dummy for substate wars

	Model 1	Model 4	Model 11	Model 12
GDP per capita	0.623**	0.821**	0.613**	0.811**
	(0.267)	(0.351)	(0.267)	(0.341)
Diamonds	0.090**	0.085**	0.091**	0.086**
	(0.029)	(0.030)	(0.030)	(0.034)
Oil	-0.039**	-0.046**	-0.039**	-0.046**
	(0.018)	(0.019)	(0.018)	(0.019)
Interventions	1.578**	1.480**	1.572**	1.484**
	(0.536)	(0.573)	(0.538)	(0.599)
Democracy	-0.561	-0.572	-0.590	-0.575
	(0.592)	(0.689)	(0.591)	(0.678)
Troop increase (5y)	0.202	0.082	0.194	0.080
	(0.138)	(0.176)	(0.141)	(0.182)
Substate war			-0.268	-0.110
			(1.203)	(1.786)
Controls for Regions	no	yes	no	yes
Controls for Decades	no	yes	no	yes
Constant	-2.281**	-1.631	-2.228**	-1.592
	(0.570)	(2.305)	(0.552)	(1.995)
Observations	104	104	104	104
Df	6	14	7	15
Log likelihood	-53.70	-47.24	-53.65	-47.24

** p<0.05, * p<0.01

Robust standard errors in parentheses

Table 9: Removing diamond outliers

	Model 4	Model 13	Model 14
GDP per capita	0.821**	0.821**	0.798**
	(0.351)	(0.351)	(0.356)
Diamonds	0.085**	0.085**	0.080**
	(0.030)	(0.030)	(0.032)
Oil	-0.046**	-0.046**	-0.044**
	(0.019)	(0.019)	(0.019)
Interventions	1.480**	1.480**	1.481**
	(0.573)	(0.573)	(0.563)
Democracy	-0.572	-0.572	-0.571
	(0.689)	(0.689)	(0.691)
Troop increase (5y)	0.082	0.082	0.076
	(0.176)	(0.176)	(0.175)
Controls for Regions	yes	yes	yes
Controls for Decades	yes	yes	yes
Constant	-1.631	-1.631	-1.555
	(2.305)	(2.306)	(2.341)
Observations	104	103	102
Df	14	14	14
Log likelihood	-47.24	-47.24	-47.06

** p<0.05, * p<0.01

Robust standard errors in parentheses

Model 13 excludes South Africa

Model 14 excludes South Africa and Angola

Table 10: Oil: robustness checks

	Model 4	Model 15	Model 16	Model 17
GDP per capita	0.821**	0.755**	0.752**	0.701
	(0.351)	(0.366)	(0.370)	(0.401)
Diamonds	0.085**	0.081**	0.081**	0.079**
	(0.030)	(0.030)	(0.030)	(0.030)
Oil	-0.046**	-0.067**	-0.066**	-0.050
	(0.019)	(0.029)	(0.030)	(0.046)
Interventions	1.480**	1.446**	1.445**	1.408**
	(0.573)	(0.552)	(0.552)	(0.553)
Democracy	-0.572	-0.375	-0.380	-0.557
	(0.689)	(0.690)	(0.691)	(0.768)
Troop increase (5y)	0.082	0.114	0.113	0.106
	(0.176)	(0.181)	(0.181)	(0.183)
Controls for Regions	yes	yes	yes	yes
Controls for Decades	yes	yes	yes	yes
Constant	-1.631	-1.786	-1.777	-1.587
	(2.305)	(2.114)	(2.125)	(2.252)
Observations	104	102	100	93
Df	14	14	14	14
Log likelihood	-47.24	-46.54	-46.53	-46.33

Robust standard errors in parentheses

** p<0.05, * p<0.01

Model 15 excludes Russia

Model 16 excludes Russia and China

Model 17 excludes Russia, China and Indonesia

Table 11: Oil dummy from Fearon and Laitin 2003

	Model 1	Model 2	Model 18	Model 19
GDP per capita	0.623**	0.352	0.362	0.075
	(0.267)	(0.349)	(0.223)	(0.285)
Diamonds	0.090**	0.075**	0.065**	0.060**
	(0.029)	(0.027)	(0.026)	(0.025)
Oil	-0.039**	-0.032		
	(0.018)	(0.018)		
Oil Fearon			-0.854	-0.212
			(0.928)	(1.057)
Interventions	1.578**	1.495**	1.926**	1.806**
	(0.536)	(0.561)	(0.547)	(0.554)
Democracy	-0.561	-0.682	-1.506**	-1.395**
	(0.592)	(0.642)	(0.720)	(0.685)
Troop increase (5y)	0.202	0.189	0.077	0.095
	(0.138)	(0.135)	(0.134)	(0.150)
Controls for Regions	no	yes	no	yes
Controls for Decades	no	no	no	no
Constant	-2.281**	0.426	-2.123**	0.553
	(0.570)	(2.410)	(0.574)	(2.224)
Observations	104	104	94	94
Log likelihood	-53.70	-49.86	-49.90	-45.77
Df	6	10	6	10

Robust standard errors in parentheses

** p<0.05, * p<0.01

Table 12: Troop increase: global vs. regional

	Model 4	Model 20	Model 21	Model 22
GDP per capita	0.821**	0.832**	0.765**	0.708**
	(0.351)	(0.348)	(0.340)	(0.345)
Diamonds	0.085**	0.085**	0.085**	0.085**
	(0.030)	(0.028)	(0.028)	(0.027)
Oil	-0.046**	-0.045**	-0.044**	-0.044**
	(0.019)	(0.017)	(0.017)	(0.018)
Interventions	1.480**	1.480**	1.466**	1.466**
	(0.573)	(0.573)	(0.573)	(0.587)
Democracy	-0.572	-0.578	-0.591	-0.554
	(0.689)	(0.696)	(0.706)	(0.701)
Troop increase (5y)	0.082			
	(0.176)			
Troop increase (reg, 5y)		0.238		
		(0.463)		
Troop increase (2y)			-0.112	
			(0.455)	
Troop increase (reg, 2y)				-1.396
				(1.630)
Controls for Regions	yes	yes	yes	yes
Controls for Decades	yes	yes	yes	yes
Constant	-1.631	-1.586	-1.695	-1.873
	(2.305)	(2.326)	(2.349)	(2.253)
Observations	104	104	104	104
Df	14	14	14	14
Log likelihood	-47.24	-47.23	-47.30	-46.71

** p<0.05, * p<0.01

Robust standard errors in parentheses

Table 13: Internal Wars with Mercenaries

Country	War Period
Afghanistan	1978-1992
Afghanistan	1992-2003
Angola	1975-1995
Angola	1998-2002
Azerbaijan	1992-1994
Bosnia-Hercegovina	1992-1995
Cambodia	1970-1975
Chad	1966-1977
Chad	1978-1993
China	1946-1950
Colombia	1965-2003
Congo, Republic of	1997-1999
Costa Rica	1948
Croatia	1991-1994
El Salvador	1979-1991
Georgia	1992-1993
Guatemala	1954
India	1956-1958
India	1989-2003
Ivory Coast	2002-2003
Laos	1963-1973
Lebanon	1975-1990
Mozambique	1979-1992
Nicaragua	1978-1979
Nicaragua	1981-1990
Nigeria	1967-1970
Nigeria	1999-2003
Russia	1994-1996
Russia	1999-2003
Serbia Montenegro	1998-2000
Sierra Leone	1991-2000
Somalia	1988-1991
South Africa	1984-1994
Sudan	1983-2003
Uganda	1981-1986
Yemen	1962-1970
Vietnam	1960-1975
Zaire/Congo	1960-1964
Zaire/Congo	1964-1966
Zaire/Congo	1967-1967
Zaire/Congo	1977-1978
Zaire/Congo	1996-1997
Zimbabwe	1973-1979

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